

Crossing the River

A group of 8 adults and 2 children needs to cross a river. A small boat is available that can hold either:



1 adult,



1 child,



or 2 children.

Note:

Unlike some related versions of this problem, you can *not* put 1 adult and 1 child in the boat together.

Everyone can row the boat.

1. How many one-way trips does it take for them all to cross the river? Explain how you arrived at your answer.

2. How many one-way trips does it take for:
 - a) 6 adults and 2 children?
 - b) 15 adults and 2 children?

 - c) 23 adults and 2 children?
 - d) 100 adults and 2 children?

3. Write a rule that tells how to find the number of one-way trips needed for any number of adults and two children to cross the river.

4. How many adults are there, if you know there are still just 2 children and it takes:
a) 13 trips? b) 41 trips? c) 57 trips?

5. Write a rule that tells how you find the number of adults if you know there are 2 children and you know the number of trips.

6. What happens to your rule if there are 3 children? 5 children? 10 children?

7. See if you can come up with a rule that tells the number of trips it would take for any number of adults and any number of children.